



January 24, 2006

Mr. Randy Duplechain
Davis, Bowen & Friedel
23 N. Walnut Street
Milford, DE 19963

RE: PLUS review – PLUS 2005-12-02; Spartan Village

Dear Mr. Duplechain:

Thank you for meeting with State agency planners on January 4, 2006 to discuss the proposed plans for the Spartan Village project to be located on the north side of Killens Pond Road, 1,680 feet East of Route 13.

According to the information received, you are seeking site plan approval for 267 residential units on 95 acres located in Level 3.

Please note that changes to the plan, other than those suggested in this letter, could result in additional comments from the State. Additionally, these comments reflect only issues that are the responsibility of the agencies represented at the meeting. The developers will also need to comply with any Federal, State and local regulations regarding this property. We also note that as Kent County is the governing authority over this land, the developers will need to comply with any and all regulations/restrictions set forth by the County.

Executive Summary

The following section includes some site specific highlights from the agency comments found in this letter. This summary is provided for your convenience and reference. The full text of this letter represents the official state response to this project. ***Our office notes that the applicants are responsible for reading and responding to this letter and all comments contained within it in their entirety.***

State Strategies/Project Location

- This project is located in Investment Level 3 according to the Strategies for State Policies and Spending. This site is also located in the Kent County Growth Zone. Investment Level 3 reflects areas where growth is anticipated by local, county, and state plans in the longer term future, or areas that may have environmental or other constraints to development. State investments will support growth in these areas, but please be advised that the State may have other priorities in the near term future. We encourage you to design the site with respect for the environmental features which are present.

Street Design and Transportation

- Killens Pond Road is classified as a local road. Local roads in Delaware typically have right-of-way widths ranging from 33 to 50 feet. DelDOT's policy is to require dedication of sufficient land to provide a minimum right-of-way width of 30 feet from the centerline on local roads. Therefore they will require right-of-way dedication along the frontage to provide any additional width needed from this project.
- DelDOT will also require that a paved multi-modal path, located in a 15-foot wide permanent easement be provided across the frontage of the site, including the 3.79-acre lot that is being left on Killens Pond Road.
- If the developer has not already done so, they should coordinate with the Lake Forest School District regarding the location of the pedestrian path shown between Lots 43 and 44 and whether a stub street, rather than a path, would be desirable.
- DelDOT recommend that a pedestrian path be provided between the cul-de-sac near Lot 86 and the knuckle at Lot 108 to encourage walking.

Natural and Cultural Resources

- Statewide Wetland Mapping Project (SWMP) maps indicate the presence of palustrine wetlands on this parcel. These wetlands provide water quality benefits, attenuate flooding and provide important habitat for plants and wildlife. Although the developer maintains a 100-foot buffer from Spring Branch an additional 100-foot vegetated buffer should be implemented from the edge of the wetland complex.

- This project is located directly adjacent to headwater wetlands associated with the Spring Branch of the greater Murderkill River. In recognition of the impacts to water and habitat quality and the necessity to protect it for long-term sustainable use, the Watershed Assessment Section strongly urges the applicant to consider the preserving the existing naturally-forested buffer in its entirety and increasing the buffer width (where applicable) to a minimum 100-foot width.
- According to the application, 2.39 acres out of 4.57 acres of forest are going to be removed along Spring Branch, a tributary of the Murderkill River. A Bald Cypress community occurs downstream and could be affected by changes in water quality and sedimentation caused by removal of trees within the riparian buffer zone. Although 2.39 acres may seem minimal, it is not only important for water quality, but some species of wildlife are dependent on even small woodlots. Migratory birds may be utilizing the forest as a stopover during long migrations. In addition, when forests are cleared, wildlife species must disperse into surrounding areas which can lead to human/animal conflicts, including interactions of the roadways. This also puts increased pressure on nearby wildlife areas, State parks, and other public lands.
- There are numerous opportunities on this site to improve the extent and function of forested buffers, particularly along Spring Branch. The developer should seriously consider placing the forest into a permanent conservation easement or other binding protection. These areas should be clearly marked and delineated so that residents understand their importance and so that homeowner activities do not infringe upon these areas.
- We recommend that the existing forest be preserved by eliminating lots 22-30 and associated infrastructure.
- The developer is encouraged to designate open space along the forested areas. The two passive open space parcels, at the southernmost portion of the parcel behind lots 47-67 totaling 2.87 acres, should be relocated to the north of the property to provide additional buffering to Spring Branch.

The following are a complete list of comments received by State agencies:

Office of State Planning Coordination – Contact: David Edgell 739-3090

This project is located in Investment Level 3 according to the Strategies for State Policies and Spending. This site is also located in the Kent County Growth Zone. Investment Level 3 reflects areas where growth is anticipated by local, county, and state plans in the

longer term future, or areas that may have environmental or other constraints to development. State investments will support growth in these areas, but please be advised that the State may have other priorities in the near term future. We encourage you to design the site with respect for the environmental features which are present.

Division of Historic and Cultural Affairs – Contact: Alice Guerrant 739-5685

The project has the potential to impact cultural resources and therefore, the Division of Historical and Cultural Affairs recommends the property owner/developer consider undertaking a cultural resource study of the project area before proceeding. Both marked and unmarked burials are protected by Delaware law. Please refer to the following sections of the Delaware State Code: (1) Title 11 Sub-Chapter 1340, titled “Desecration of Burial Places”; and (2) Title 7 Chapter 54, known as the “Delaware Unmarked Human Remains Act”. For more information about these laws and the implications for the project, contact Craig Lukesic or Faye Stocum of this office at 302-736-7400. The Division provides a list of qualified consultants on our web site at <http://www.state.de.us/shpo/PDF/Consultants.pdf>.

Department of Transportation – Contact: Bill Brockenbrough 760-2109

- 1) A traffic impact study (TIS) was completed for what was substantially this development, under the name Winkler Property. As studied, the development consisted of 138 single-family detached houses, 56 duplex dwellings and 81 townhouses on a 91-acre assemblage of parcels. The firm of McCormick Taylor, under contract to DelDOT, reviewed the TIS at and sent comments to DelDOT on September 2, 2005. DelDOT sent those comments to Kent County on September 26, 2005, and then sent a revised recommendation to the County on October 12, 2005. Copies of all three letters are enclosed.
- 2) Killens Pond Road is classified as a local road. Local roads in Delaware typically have right-of-way widths ranging from 33 to 50 feet. DelDOT’s policy is to require dedication of sufficient land to provide a minimum right-of-way width of 30 feet from the centerline on local roads. Therefore they will require right-of-way dedication along the frontage to provide any additional width needed from this project.
- 3) DelDOT will also require that a paved multi-modal path, located in a 15-foot wide permanent easement be provided across the frontage of the site, including the 3.79-acre lot that is being left on Killens Pond Road.

- 4) DelDOT commended the developer for providing the proposed stub street to the adjacent property to the west, and the cul-de-sac, which could be used as a stub street to the 3.79-acre outlot mentioned above.
- 5) If the developer has not already done so, they should coordinate with the Lake Forest School District regarding the location of the pedestrian path shown between Lots 43 and 44. It may be more appropriate to place it near the road, where it could also be used by high school students. Also, the developer should discuss with the School District whether a stub street, rather than a path, would be desirable. While the existing elementary school's paved areas are on the opposite side of the site, a stub street might fit with the District's plans for future development.
- 6) DelDOT recommend that a pedestrian path be provided between the cul-de-sac near Lot 86 and the knuckle at Lot 108 to encourage walking.
- 7) The developer's site engineer should contact Mr. Brad Herb, the DelDOT project manager for Kent County, regarding specific requirements for streets and access. He may be reached at (302) 266-9600.

**The Department of Natural Resources and Environmental Control – Contact:
Kevin Coyle 739-9071**

Green Infrastructure

Portions or all of the lands associated with this proposal are within the Livable Delaware Green Infrastructure area established under Governor Minner's Executive Order #61 that represents a network of ecologically important natural resource lands of special state conservation interest.

Green infrastructure is defined as Delaware's natural life support system of parks and preserves, woodlands and wildlife areas, wetlands and waterways, productive agricultural and forest land, greenways, cultural, historic and recreational sites and other natural areas all with conservation value. Preserving Delaware's Green Infrastructure network will support and enhance biodiversity and functional ecosystems, protect native plant and animal species, improve air and water quality, prevent flooding, lessen the disruption to natural landscapes, provide opportunities for profitable farming and forestry enterprises, limit invasive species, and foster ecotourism.

Voluntary stewardship by private landowners is essential to green infrastructure conservation in Delaware, since approximately 80 percent of the State's land base is in

private hands. It is in that spirit of stewardship that the Department appeals to the landowner and development team to protect sensitive resources through an appropriate site design.

Soils

Based on the Kent County soil survey Sassafras, Rumford, Fallsington, and Johnston were mapped in the immediate vicinity of the proposed project. Sassafras and Rumford are well-drained upland soils that, generally, have few limitations for development. Fallsington is a poorly-drained wetland associated (hydric) soil that has severe limitations for development. Johnston is a very poorly-drained wetland associated (hydric) floodplain soil that has the highest severity level for development.

Wetlands

Statewide Wetland Mapping Project (SWMP) maps indicate the presence of palustrine wetlands on this parcel.

These wetlands provide water quality benefits, attenuate flooding and provide important habitat for plants and wildlife. Although the developer maintains a 100-foot buffer from Spring Branch an additional 100-foot vegetated buffer should be implemented from the edge of the wetland complex. The developer should note that both DNREC and Army Corps of Engineers discourage allowing lot lines to contain wetlands to minimize potential cumulative impacts resulting from unauthorized and/or illegal activities and disturbances that can be caused by homeowners.

It is recommended that the Farm Services Agency of the USDA be contacted to assess whether the farmed wetlands on subject parcel meet the recognized criteria for classification as "prior converted wetlands." Prior converted wetlands are farmed wetlands that have drained or altered before December 23, 1985, and no longer meet the wetland criteria established under the 404 program. Such wetlands are considered exempt from regulatory protection provided that there is no proof of a continuous "fallow period" of five years or greater in that parcel's cropping history. Parcels converted after said date regardless of cropping history are considered jurisdictional by the Army Corps of Engineers (ACOE). The contact person for assessing a parcel's cropping history is Sally Griffin at the USDA; she can be reached at 678-4182.

This project is located directly adjacent to headwater wetlands associated with the Spring Branch of the greater Murderkill River - greatly increasing the probability of harmful impacts to surface and groundwater quality to all waters within the Murderkill River watershed - making it more difficult for the State to achieve future required TMDL

nutrient reductions. It should also be noted that harmful impacts to water quality result in the deterioration in the ecological function of a stream along its entire length, including the floodplain system further downstream. In recognition of the impacts to water and habitat quality and the necessity to protect it for long-term sustainable use, the Watershed Assessment Section strongly urges the applicant to consider the preserving the existing naturally-forested buffer in its entirety and increasing the buffer width (where applicable) to a minimum 100-foot width.

Wetland Permitting Information

PLUS application materials indicate that wetlands have been delineated (presumably a field delineation). This delineation should be verified by the Army Corps of Engineers through the Jurisdictional Determination process. Please note that impacts to palustrine wetlands are regulated by the Army Corps of Engineers through Section 404 of the Clean Water Act. In situations where the applicant believes that the delineated wetlands on their parcel are nonjurisdictional isolated wetlands, the Corps must be contacted to make the final jurisdictional assessment. They can be reached by phone at 736-9763.

In addition, individual 404 permits and certain Nationwide Permits from the Army Corps of Engineers also require 401 Water Quality Certification from the DNREC Wetland and Subaqueous Land Section and Coastal Zone Federal Consistency Certification from the DNREC Division of Soil and Water Conservation, Delaware Coastal Programs Section. Each of these certifications represents a separate permitting process.

To find out more about permitting requirements, the applicant is encouraged to attend a Joint Permit Process Meeting. These meetings are held monthly and are attended by federal and state resource agencies responsible for wetland permitting. Contact Denise Rawding at (302) 739-9943 to schedule a meeting.

Impervious Cover

Based on a review of the submitted PLUS application, the applicant projects that less than 30 percent of this parcel will be rendered impervious following this parcel's development, a figure that likely understates the actual amount of created post-development constructed surface imperviousness given the scope and density of this project. The applicant should be made aware that all forms of constructed surface imperviousness (i.e., rooftops, sidewalks and roads) should be included in the impervious surface calculation; otherwise, an inaccurate assessment of this project's actual environmental impacts will be made. It is strongly advised, therefore, that the applicant recalculate the amount of this project's projected surface imperviousness using

a more realistic assessment that includes all of the above-referenced forms of surface imperviousness.

Research has consistently shown that once a watershed exceeds a threshold of 10 percent imperviousness, there is an irreversible decline in both water and habitat quality. Based on analyses of 2002 aerial photography by the University of Delaware, the Murderkill watershed, at that time, had about 8.1 percent impervious cover. Although this data is almost 4 years old and likely an underestimate, it illustrates the importance of a proactive strategy to mitigate for predictable and likely cumulative environmental impacts. Since the amount of imperviousness generated by this project will be significantly higher than the desirable watershed threshold of 10 percent, the applicant is strongly advised to pursue best management practices (BMPs) that mitigate or reduce some of the most likely adverse impacts. Reducing the amount of surface imperviousness through the use of pervious paving materials (“pervious pavers”) in lieu of asphalt or concrete in conjunction with an increase in forest cover via preservation or additional tree plantings are examples of practical BMPs that could easily be implemented to reduce surface imperviousness.

TMDLs

With the adoption of Total Maximum Daily Loads (TMDLs) as a “nutrient-runoff-mitigation strategy” for reducing nutrients in the Murderkill River watershed, reduction of nitrogen and phosphorus loading will be mandatory. A TMDL is the maximum level of pollution allowed for a given pollutant below which a “water quality limited water body” can assimilate and still meet water quality standards to the extent necessary to support use goals such as, swimming, fishing, drinking water and shell fish harvesting. Nutrient reductions prescribed under TMDLs are assigned to those watersheds or basins on the basis of recognized water quality impairments.

In the Murderkill watershed, the primary source of water quality impairment is associated with nutrient runoff from agricultural and/or residential development. In order to mitigate for the aforementioned impairments, a post-development TMDL reduction level of 50 and 30 percent will be required for nitrogen and phosphorus, respectively. Compliance with the post-development TMDL nutrient loading reduction requirements will be assessed via nutrient budget protocol, a computer-based model that quantifies post-development nutrient loading under a variety of land use scenarios in combination with a variety (or absence) of BMP types and intensities. This post-development loading rate is then compared with the pre-development loading rate as a means to assess whether the project meets the acceptable TMDL reduction levels. Based on a preliminary evaluation of this project using this model, the development as currently conceived **does not** meet the Murderkill River watershed TMDL nutrient reduction requirements for

nitrogen and phosphorus. The applicant is strongly advised to consider the use of appropriate BMPs and Best Available Technologies (BATs) to ensure compliance. Examples of BMPs or BATs that should be used to significantly reduce nutrient loading from this project, include: practices that prevent or mitigate surface imperviousness; maintenance of recommended wetland buffer widths; and the use of innovative or “green-technology” stormwater methodologies. As mentioned previously, it is suggested that the applicant recalculate the projected amount of post-development impervious cover on the basis of a more realistic assessment (see the impervious cover section) since surface imperviousness is an important variable in the nutrient budget calculation. We suggest that the applicant verify their project’s compliance with the specified TMDL loading rates by running the model themselves (using the corrected impervious cover figure). Please contact Lyle Jones of Watershed Section at 739-9939 for the acceptable model protocol.

Water Resource Protection Areas

The entire site falls within an excellent recharge area (see attached map).

According to the State law that created the Source Water Protection Program, county and municipal governments with more than 2,000 residents will be required to enact ordinances to protect Water Resource Protection Areas. Municipalities with fewer than 2,000 residents are encouraged to enact such ordinances. The following language has been excerpted from the Source Water Protection Guidance Manual for Local Governments, Supplement 1 - Ground-Water Recharge Design Methodology. While the local ordinances may not yet be in place, the developer may find the language useful in modifying the site plan to protect water resources.

Water Resource Protection Areas (WRPAs) are defined as (1) surface water areas such as floodplains, limestone aquifers, and reservoir watersheds, (2) wellhead areas, or (3) excellent recharge areas. The purpose of an impervious cover threshold is to minimize loss of recharge and protect the quality and quantity of ground and surface water supplies in WRPAs.

New development in WRPAs may exceed the 20% impervious cover threshold, but be no more than 50% impervious, provided the applicant submits an environmental assessment report recommending a climatic water budget and facilities to augment recharge. The environmental assessment must document that post-development recharge will be no less than predevelopment recharge when computed on an annual basis.

Commonly, the applicant offsets the loss of recharge due to impervious cover by constructing recharge basins that convey relatively pure rooftop runoff for infiltration to ground water.

The Department recommends the following (ranked in order of preference):

- 1) Preserve WRPA's as open space and parks by acquisition or conservation easement.
- 2) Limit impervious cover of new development to 20% by right within WRPA's.
- 3) Allow impervious cover of new development to exceed 20% within WRPA's (but no more than 50% impervious) provided the applicant develops recharge facilities that directly infiltrate rooftop runoff.
- 4) Allow impervious cover of new development to exceed 20% within WRPA's (but no more than 50% impervious) provided the applicant develops recharge facilities that infiltrate stormwater runoff from forested and/or grassed surfaces with pretreatment.

For more information, refer to:

Source Water Protection Guidance Manual for the Local Governments of Delaware at

<http://www.wr.udel.edu/swaphome/phase2/SWPguidancemanual.html>

and

Ground-Water Recharge Design Methodology at

http://www.wr.udel.edu/swaphome/phase2/Publications/swapp_manual_final/swapp_guidance_manual_supp_1_2005_05_02.pdf

Water Supply

The information provided indicates that the Town of Felton will provide water to the proposed projects through a central public water system. Our files reflect that Town of Felton does not currently hold a certificate of public convenience and necessity (CPCN) to provide public water in these areas. They will need to file an application for a CPCN with the Public Service Commission, if they have not done so already. Information on CPCN requirements and applications can be obtained by contacting the Public Service Commission at 302-739-4247.

Should dewatering points be needed during any phase of construction, a dewatering well construction permit must be obtained from the Water Supply Section prior to construction of the well points. In addition, a water allocation permit will be needed if the pumping rate will exceed 50,000 gallons per day at any time during operation.

All well permit applications must be prepared and signed by licensed water well contractors, and only licensed well drillers may construct the wells. Please factor in the necessary time for processing the well permit applications into the construction schedule. Dewatering well permit applications typically take approximately four weeks to process, which allows the necessary time for technical review and advertising.

Should you have any questions concerning these comments, please contact Rick Rios at 302-739-9944.

Sediment and Erosion Control/Stormwater Management

A detailed sediment and stormwater plan will be required prior to any land disturbing activity taking place on the site. The plan review and approval as well as construction inspection will be coordinated through Kent Conservation District. Contact Jared Adkins, Program Manager, at (302) 741-2600, ext. 3, for details regarding submittal requirements and fees.

A Notice of Intent (NOI) for Stormwater Discharges Associated with Construction Activity must be submitted to DNREC Division of Soil and Water Conservation along with the \$195 NOI fee prior to plan approval.

Applying practices to mimic the pre-development hydrology on the site, promote recharge, maximize the use of existing natural features on the site, and limit the reliance on structural stormwater components, such as maintaining open spaces, should be considered in the overall design of the project as a stormwater management technique. Green Technology BMPs must be given first consideration for stormwater quality management. Each stormwater management facility should have an adequate outlet for release of stormwater.

It is strongly recommended that you contact the reviewing agency to schedule a preliminary meeting to discuss the sediment and erosion control and stormwater management components of the plan. The site topography, soils mapping, pre- and post-development runoff, and proposed method(s) and location(s) of stormwater management should be brought to the meeting for discussion. Explore the use of a created wetland to filter excess nutrients in stormwater runoff from this site before releasing stormwater into Spring Branch.

Drainage

The Drainage Program requests the engineer take precautions to ensure the project does not hinder any off site drainage upstream of the project or create any off site drainage

problems downstream by the release of on site storm water. The Drainage Program requests the engineer check downstream for function and blockages prior to construction.

Please notify downstream landowners if there will be a change in the volume of water released on them.

The Drainage Program encourages the elevation of rear yards to direct water towards the streets where storm drains are accessible for maintenance. The Drainage Program recognizes the need for catch basins in rear yards in certain cases. Catch basins placed in rear yards will need to be clear of obstructions and be accessible for maintenance. Decks, sheds, fences, and kennels should not be placed along the storm drain or near the catch basin. Deed restrictions or easements recorded on the deed, should be placed on the property to ensure maintenance access.

This project is within the Murderkill River Watershed, a designated critical area, with a promulgated Total Maximum Daily Load (TMDL). Preserve existing riparian buffers to aid in the reduction of nutrients, sediment, and other pollutants. For the further enhancement of water quality in the Murderkill watershed, the Drainage Program encourages additional widths of vegetated buffers and other water quality measures on this project. Please explore the use of a created wetland to filter excess nutrients in stormwater runoff from this site before releasing stormwater into Spring Branch.

Floodplains

Kent County does not permit the subdivision of land in the 100-year floodplain. As long as no development is proposed in the floodplain, then no additional flood studies or design restrictions would apply.

Forest Preservation

According to the application, 2.39 acres out of 4.57 acres of forest are going to be removed along Spring Branch, a tributary of the Murderkill River. A Bald Cypress community occurs downstream and could be affected by changes in water quality and sedimentation caused by removal of trees within the riparian buffer zone. Although 2.39 acres may seem minimal, it is not only important for water quality, but some species of wildlife are dependent on even small woodlots. Migratory birds may be utilizing the forest as a stopover during long migrations. In addition, when forests are cleared, wildlife species must disperse into surrounding areas which can lead to human/animal conflicts, including interactions of the roadways. This also puts increased pressure on nearby wildlife areas, State parks, and other public lands.

There are numerous opportunities on this site to improve the extent and function of forested buffers, particularly along Spring Branch. The developer should seriously consider placing the forest into a permanent conservation easement or other binding protection. These areas should be clearly marked and delineated so that residents understand their importance and so that homeowner activities do not infringe upon these areas.

DNREC recommends that the existing forest be preserved by eliminating lots 22-30 and associated infrastructure. If the forest is cleared despite our recommendation, trees should not be removed April 1st to July 31st to reduce impacts to nesting birds and other wildlife species that utilize forests for breeding.

Open Space

The developer is encouraged to designate open space along the forested areas. The two passive open space parcels, at the southernmost portion of the parcel behind lots 47-67 totaling 2.87 acres, should be relocated to the north of the property to provide additional buffering to Spring Branch. In areas set aside for passive open space, the developer is encouraged to consider establishment of additional forested areas or meadow-type grasses. Once established, these ecosystems provide increased water infiltration into groundwater, decreased run-off into surface water, air quality improvements, and require much less maintenance than traditional turf grass, an important consideration if a homeowners association will take over responsibility for maintenance of community open spaces.

Open space containing forest and/or wetlands should be placed into a permanent conservation easement or other permanent protection mechanism. Conservation areas should also be demarked to avoid infringement by homeowners.

Nuisance Waterfowl

Stormwater management ponds that remain in the site plan may attract waterfowl like resident Canada geese and mute swans. High concentrations of waterfowl in ponds create water-quality problems, leave droppings on lawn and paved areas and can become aggressive during the nesting season. Short manicured lawns around ponds provide an attractive habitat for these species. We recommend native plantings of tall grasses, wildflowers, shrubs, and trees at the edge and within a buffer area (50 feet) around the perimeter. Waterfowl do not feel safe when they can not see the surrounding area for possible predators. These plantings should be completed as soon as possible as it is easier to deter geese when there are only a few than it is to remove them once they become

plentiful. The Division of Fish and Wildlife does not provide goose control services, and if problems arise, residents or the home-owners association will have to accept the burden of dealing with these species (e.g., permit applications, costs, securing services of certified wildlife professionals). Solutions can be costly and labor intensive; however, with proper landscaping, monitoring, and other techniques, geese problems can be minimized.

Solid Waste

Each Delaware household generates approximately 3,600 pounds of solid waste per year. On average, each new house constructed generates an additional 10,000 pounds of construction waste. Due to Delaware's present rate of growth and the impact that growth will have on the state's existing landfill capacity, the applicant is requested to be aware of the impact this project will have on the State's limited landfill resources and, to the extent possible, take steps to minimize the amount of construction waste associated with this development.

Underground Storage Tanks

There is one inactive LUST site(s) located near the proposed project:

Uncle Willie's #13, Facility # 1-000363, Project # K0310059

No environmental impact is expected from the above inactive/active LUST site(s). However, should any underground storage tank or petroleum contaminated soil be discovered during construction, the Tank Management Branch must be notified as soon as possible. It is not anticipated that any construction specifications would be need to be changed due to petroleum contamination. However, should any unanticipated contamination be encountered and PVC pipe is being utilized, it will need to be changed to ductile steel with nitrile rubber gaskets in the contaminated areas.

Air Quality

Once complete, vehicle emissions associated with this project are estimated to be 20.5 tons (40,981.7 pounds) per year of VOC (volatile organic compounds), 17.0 tons (33,930.1 pounds) per year of NO_x (nitrogen oxides), 12.5 tons (25,034.2 pounds) per year of SO₂ (sulfur dioxide), 1.1 ton (2,228.5 pounds) per year of fine particulates and 1,714.0 tons (3,428,068.1 pounds) per year of CO₂ (carbon dioxide).

Emissions from area sources associated with this project are estimated to be 8.3 tons

(16,529.8 pounds) per year of VOC (volatile organic compounds), 0.9 ton (1,818.8 pounds) per year of NO_x (nitrogen oxides), 0.8 ton (1,509.3 pounds) per year of SO₂ (sulfur dioxide), 1.0 ton (1,947.7 pounds) per year of fine particulates and 33.5 tons (67,008.1 pounds) per year of CO₂ (carbon dioxide).

Emissions from electrical power generation associated with this project are estimated to be 3.3 tons (6,551.2 pounds) per year of NO_x (nitrogen oxides), 11.4 tons (22,786.8 pounds) per year of SO₂ (sulfur dioxide) and 1,680.5 tons (3,361,060.1 pounds) per year of CO₂ (carbon dioxide).

	VOC	NO _x	SO ₂	PM _{2.5}	CO ₂
Mobile	20.5	17.0	12.5	1.1	1714.0
Residential	8.3	0.9	0.8	1.0	33.5
Electrical Power		3.3	11.4		1680.5
TOTAL	28.8	21.2	24.7	2.1	3428.0

For this project the electrical usage via electric power plant generation alone totaled to produce an additional 3.3 tons of nitrogen oxides per year and 11.4 tons of sulfur dioxide per year.

A significant method to mitigate this impact would be to require the builder to construct Energy Star qualified homes. Every percentage of increased energy efficiency translates into a percent reduction in pollution. Quoting from their webpage, <http://www.energystar.gov/>:

“ENERGY STAR qualified homes are independently verified to be at least 30% more energy efficient than homes built to the 1993 national Model Energy Code or 15% more efficient than state energy code, whichever is more rigorous. These savings are based on heating, cooling, and hot water energy use and are typically achieved through a combination of:

building envelope upgrades,
high performance windows,
controlled air infiltration,
upgraded heating and air conditioning systems,
tight duct systems and
upgraded water-heating equipment.”

The Energy office in DNREC is in the process of training builders in making their structures more energy efficient. The Energy Star Program is excellent way to save on

energy costs and reduce air pollution. They highly recommend this project development and other residential proposals increase the energy efficiency of their homes.

They also recommend that the home builders offer geothermal and photo voltaic energy options. Applicable vehicles should use retrofitted diesel engines during construction. The development should provide tie-ins to the nearest bike paths, links to mass transit, and fund a lawnmower exchange program for their new occupants.

State Fire Marshal's Office – Contact: John Rossiter 739-4394

These comments are intended for informational use only and do not constitute any type of approval from the Delaware State Fire Marshal's Office. At the time of formal submittal, the applicant shall provide; completed application, fee, and three sets of plans depicting the following in accordance with the Delaware State Fire Prevention Regulation (DSFPR):

a. **Fire Protection Water Requirements:**

- Water distribution system capable of delivering at least 1000 gpm for 1-hour duration, at 20-psi residual pressure is required. Fire hydrants with 800 feet spacing on centers. (Assembly and Townhouses)
- Where a water distribution system is proposed for single family dwellings it shall be capable of delivering at least 500 gpm for 1-hour duration, at 20-psi residual pressure. Fire hydrants with 1000 feet spacing on centers are required. (One & Two- Family Dwelling)
- Where a water distribution system is proposed for the site, the infrastructure for fire protection water shall be provided, including the size of water mains for fire hydrants and sprinkler systems.

b. **Fire Protection Features:**

- All structures over 10,000 Sq. Ft. aggregate will require automatic sprinkler protection installed.
- Buildings greater than 10,000 sq.ft., 3-stories or more or over 35 feet, or classified as High Hazard, are required to meet fire lane marking requirements.
- Show Fire Department Connection location (Must be within 300 feet of fire hydrant), and detail as shown in the DSFPR.
- Show Fire Lanes and Sign Detail as shown in DSFPR
- For townhouse buildings, provide a section / detail and the UL design number of the 2-hour fire rated separation wall on the Site plan.

Accessibility

- All premises which the fire department may be called upon to protect in case of fire, and which are not readily accessible from public roads, shall be provided with suitable gates and access roads, and fire lanes so that all buildings on the premises are accessible to fire apparatus. This means that the access road to the subdivision from Killens Pond Road must be constructed so fire department apparatus may negotiate it.
- Fire department access shall be provided in such a manner so that fire apparatus will be able to locate within 100 ft. of the front door.
- Any dead end road more than 300 feet in length shall be provided with a turn-around or cul-de-sac arranged such that fire apparatus will be able to turn around by making not more than one backing maneuver. The minimum paved radius of the cul-de-sac shall be 38 feet. The dimensions of the cul-de-sac or turn-around shall be shown on the final plans. Also, please be advised that parking is prohibited in the cul-de-sac or turn around.
- The use of speed bumps or other methods of traffic speed reduction must be in accordance with Department of Transportation requirements.
- The local Fire Chief, prior to any submission to our Agency, shall approve in writing the use of gates that limit fire department access into and out of the development or property.

c. Gas Piping and System Information:

- Provide type of fuel proposed, and show locations of bulk containers on plan.

d. Required Notes:

- Provide a note on the final plans submitted for review to read “ All fire lanes, fire hydrants, and fire department connections shall be marked in accordance with the Delaware State Fire Prevention Regulations”
- Proposed Use
- Alpha or Numerical Labels for each building/unit for sites with multiple buildings/units
- Square footage of each structure (Total of all Floors)
- National Fire Protection Association (NFPA) Construction Type
- Maximum Height of Buildings (including number of stories)
- Townhouse 2-hr separation wall details shall be shown on site plans
- Note indicating if building is to be sprinklered
- Name of Water Provider
- Letter from Water Provider approving the system layout

- Provide Lock Box Note (as detailed in DSFPR) if Building is to be sprinklered
- Provide Road Names, even for County Roads

Preliminary meetings with fire protection specialists are encouraged prior to formal submittal. Please call for appointment. Applications and brochures can be downloaded from our website: www.delawarestatefiremarshal.com, technical services link, plan review, applications or brochures.

Department of Agriculture - Contact: Milton Melendez 698-4500

The Delaware Department of Agriculture has no objections to the Mack/McCall Property application. The site is located on a controlled development area. The *Strategies for State Policies and Spending* encourages environmentally responsible development in areas within a Growth Level 3 Zone. This site is a part of an “excellent recharge” area. DNREC has mapped all ground water potential recharge areas. An “excellent recharge” rating is the highest rating and designates an area as having important groundwater recharge qualities. Maintaining pervious cover in “Excellent” and “Good” recharge areas is crucial for the overall environmental health of our state and extremely important to efforts which ensure a safe drinking water supply for future generations. Retention of pervious cover to ensure an adequate future water supply is also important for the future viability of agriculture in the First State. The loss of every acre of land designated as “excellent” and “good” recharge areas adversely impacts the future prospects for agriculture in Delaware.

Right Tree for the Right Place

The Delaware Department of Agriculture Forest Service encourages the developer to use the “Right Tree for the Right Place” for any design considerations. This concept allows for the proper placement of trees to increase property values in upwards of 25% of appraised value and will reduce heating and cooling costs on average by 20 to 35 dollars per month. In addition, a landscape design that encompasses this approach will avoid future maintenance cost to the property owner and ensure a lasting forest resource.

Native Landscapes

The Delaware Department of Agriculture and the Delaware Forest Service encourages the developer to use native trees and shrubs to buffer the property from the adjacent land-use activities near this site. A properly designed forested buffer can create wildlife habitat corridors and improve air quality to the area by removing six to eight tons of carbon dioxide annually and will clean our rivers and creeks of storm-water run-off pollutants. To learn more about acceptable native trees and how to avoid plants considered invasive

to our local landscapes, please contact the Delaware Department of Agriculture Plant Industry Section at (302) 698-4500.

Tree Mitigation

The Delaware Forest Service encourages the developer to implement a tree mitigation program to replace trees at a 1:1 ratio within the site and throughout the community. This will help to meet the community's forestry goals and objectives and reduce the environmental impacts to the surrounding natural resources. To learn more, please contact our offices at (302) 349-5754.

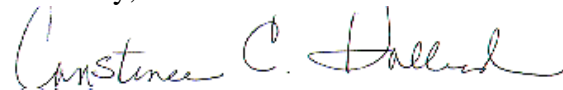
Public Service Commission - Contact: Andrea Maucher 739-4247

Any expansion of natural gas or installation of a closed propane system must fall within Pipeline Safety guidelines. Contact: Malak Michael at (302) 739-4247.

Following receipt of this letter and upon filing of an application with the local jurisdiction, the applicant shall provide to the local jurisdiction and the Office of State Planning Coordination a written response to comments received as a result of the pre-application process, noting whether comments were incorporated into the project design or not and the reason therefore.

Thank you for the opportunity to review this project. If you have any questions, please contact me at 302-739-3090.

Sincerely,

A handwritten signature in cursive script, reading "Constance C. Holland".

Constance C. Holland, AICP
Director

CC: Kent County
Town of Felton

Attachments: TIS Letter from McCormick Taylor to DelDOT
DelDOT letter dated September 26, 2005
DelDOT TIS letter dated October 12, 2005

September 2, 2005

Mr. Todd J. Sammons
Project Engineer
DelDOT Division of Planning
P.O. Box 778
Dover, DE 19903

DELAWARE DEPARTMENT OF
TRANSPORTATION
SEP 15 2005
DIVISION OF PLANNING

RE: Agreement No. 1294
Traffic Impact Study Review Services
Task No. 59 – Winkler Property

Dear Mr. Sammons,

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the ~~Winkler~~ Property prepared by Davis, Bowen & Friedel, Inc. (DBF), dated July 2005. This review was assigned as Task Number 59. DBF prepared the report in a manner generally consistent with DelDOT's *Rules and Regulations for Subdivision Streets*.

The TIS evaluates the impacts of the Winkler Property residential development, proposed for a group of parcels that represent approximately 91-acres of land located on the north side of Killens Pond Road (Kent Road 384) and east of US Route 13 in Kent County, Delaware. This residential development includes 275 mixed-use dwelling units, consisting of 138 single-family detached houses, 56 duplexes, and 81 townhouses. The developer has proposed two access points for the development along Killens Pond Road.

Based on our review, we have the following comments and recommendations.

Should the County choose to approve the proposed development, the following items should be incorporated into the site design, should be reflected on the record plan, and should be completed during or prior to the first phase of development street construction:

1. The developer should improve Killens Pond Road, from US Route 13 to Chimney Hill Road (Kent Road 385) to meet DelDOT's local road standards as nearly as possible within the available right-of-way. These improvements should include two eleven-foot travel lanes and two five-foot shoulders.
2. The following bicycle and pedestrian improvements should be included:
 - a. The developer should investigate potential bicycle and pedestrian connections between the proposed development driveways and the existing bicycle path along the south side of Killens Pond Road in order to facilitate safe access to the bicycle path.

- b. A five-foot bicycle lane should be striped through each of the development's entrances (in addition to any required turn lanes) in order to facilitate safe and unimpeded bicycle travel.
- c. Utility covers should be moved outside of any potential bicycle lane or be flush with the pavement.
- d. Regulatory/warning signage should be added to any forthcoming plans to this project in order to alert motorists to the presence of bicycle traffic.
- e. Internal sidewalks should be installed within the development.
- f. A ten-foot minimum width multi-modal path with a minimum of a five-foot buffer from the roadway should be constructed along Killens Pond Road for the length the site frontage to facilitate future connection to the Lake Forest Elementary school property.

Please note that this review generally focuses on capacity and level of service issues; additional safety and operational issues will be further addressed through DelDOT's subdivision review process.

Additional details on our review of the Winkler Property Traffic Impact Study are attached. Please contact me at (302) 738-0203 or through e-mail at mluszczyk@mtmail.biz if you have any questions concerning this review.

Sincerely,
McCormick Taylor, Inc.



Mark Luszczyk, P.E., PTOE, AICP
Associate

Enclosures

General Information

Report dates: July 2005

Prepared by: Davis, Bowen & Friedel, Inc.

Prepared for: Mike Harrington

Tax parcel: SM-00-139.00-01-48.01
SM-00-139.00-01-50.00
SM-00-139.00-01-51.00

Generally consistent with DelDOT's Rules and Regulations for Subdivision Streets: Yes.

Project Description and Background

Description: Development of 275 mixed-use dwelling units consisting of 138 single-family detached houses, 56 duplexes, and 81 townhouses.

Location: The proposed development is located on the north side of Killens Pond Road (Kent Road 385) and east of US Route 13 in Kent County, Delaware.

Amount of land to be developed: Approximately 91-acres

Land use approval(s) needed: Rezoning of parcels from Agricultural Conservation to a Planned Unit Development (PUD).

Proposed completion date: 2012

Proposed access locations: Two access points to the development are proposed, with both along Killens Pond Road.

Livable Delaware

(Source: Delaware Strategies for State Policies and Spending, July 2004)

Location with respect to the Strategies for State Policies and Spending Map of Delaware:

The proposed location of the Winkler Property is within an Investment Level 3 area.

Description of Investment Level:

Investment Level 3:

These areas are portions of the county designated for growth, development districts, or long-term annexation. Areas classified as an Investment Level 3 will be considered for state investing after the Level 1 and 2 areas are substantially built out or when the facilities are logical extensions of existing systems and deemed appropriate to serve a particular area. Many of the areas within the Investment Level 3 designation include important farmland and natural resources along with portions of roadways that are designated for corridor capacity protection. Therefore the character pattern and timing of growth along with federally mandated air and water quality goals should be considered on a case-by-case basis for areas within this designation.

In Investment Level 3 Areas, the state will continue to invest in the regional roadway network and roadway safety while continuing to protect the capacity of major transportation corridors, such as Route 13. Roadway improvements to support new development are not encouraged in Investment Level 3 and funds will not be allocated for these types of improvements until they have been allocated to Level 1 and 2 areas.

Proposed Development's Compatibility with Livable Delaware:

The Livable Delaware plan is a strategy that seeks to curb sprawl and direct growth to areas where the state, counties and local governments are most prepared for it in terms of infrastructure investment and planning. The proposed Winkler Property is located within an area listed as Investment Level 3, and is compatible with the purpose of the Livable Delaware plan because the properties location is adjacent to already developed Investment Level 2 regions, and is near to the growing towns of Felton and Camden, Delaware.

Comprehensive Plan

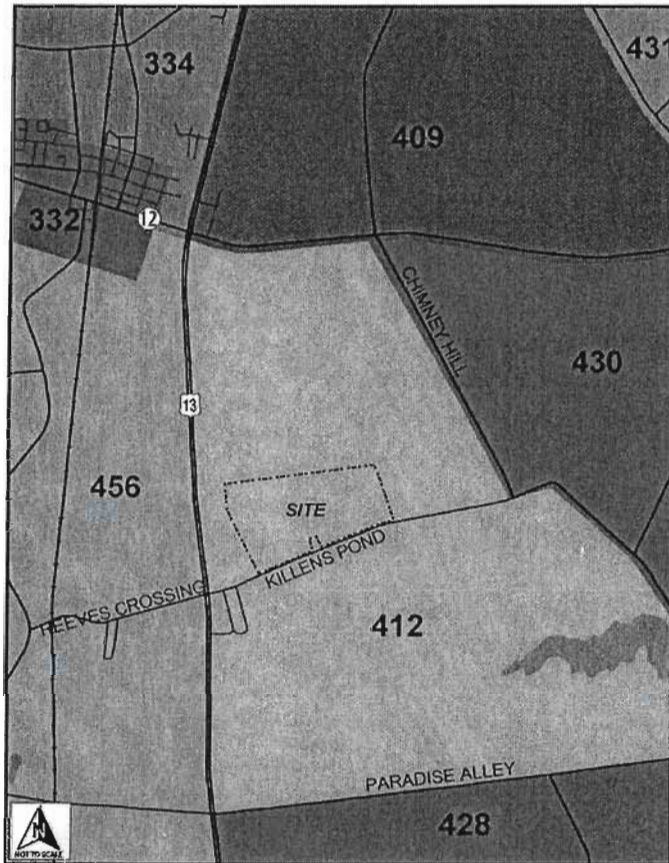
The proposed development is located within Kent County boundaries.

Kent County Comprehensive Plan: *(Source: Kent County March 23, 2002 Comprehensive Plan Update)* The area of the proposed development is in an region that is shown as low density agricultural conservation on the existing land use map for Kent County's Comprehensive Plan. This type of area encourages low density development of one to three single-family households per acre.

Proposed Development's Compatibility with Comprehensive Plans: The proposed development is consistent with the Kent County comprehensive plan and is not governed by any other comprehensive plans. The proposed development is for 275 dwelling units spread over 91 acres, which is approximately three dwelling units per acre. Development is proposed as a Planned Unit Development (PUD) area that is located near the expanding communities of Felton and Camden, Delaware, and is within expected growth boundaries as shown in the comprehensive plan.

Transportation Analysis Zones (TAZ) where development would be located: 412 (Kent County TAZ Code).

TAZ Boundaries:



Current employment estimate for TAZs: 307 jobs in 2005

Future employment estimate for TAZs: 355 jobs in 2030

Current population estimate for TAZs: 359 in 2005

Future population estimate for TAZs: 378 in 2030

Current household estimate for TAZs: 135 in 2005

Future household estimate for TAZs: 148 in 2030

Relevant committed developments in the TAZs: None

Would the addition of committed developments to current estimates exceed future projections: No

Would the addition of committed developments and the proposed development to current estimates exceed future projections: Yes

Relevant Projects in the DelDOT Capital Transportation Program (2005-2010)

None to be considered.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Seventh Edition, published by the Institute of Transportation Engineers (ITE). Land Use Codes 210 (Single-family Detached Houses) and 230 (Residential Townhouses) were used to determine how many new trips the Winkler Property would generate.

Table 1. Winkler Property Trip Generation

Single-Family Detached Houses (Land Use Code 210)	Morning Peak Hour			Evening Peak Hour		
	In	Out	Total	In	Out	Total
194 Dwelling Units	36	109	145	123	72	195
Residential Townhouses (Land Use Code 230)	Morning Peak Hour			Evening Peak Hour		
	In	Out	Total	In	Out	Total
81 Dwelling Units	7	37	44	34	17	51
TOTAL	43	146	189	157	89	246

Overview of TIS

Intersections examined:

- 1) US Route 13 & Killens Pond Road (Kent Road 384) / Reeves Crossing Road (Kent Road 286)
- 2) Killens Pond Road & Lake Forest High School/Lake Forest Central Elementary School (West Entrance)
- 3) Killens Pond Road & Lake Forest High School/Lake Forest Central Elementary School (East Entrance)
- 4) Killens Pond Road & Chimney Hill Road (Kent Road 385)
- 5) Killens Pond Road & West Site Entrance
- 6) Killens Pond Road & East Site Entrance

Conditions examined:

- Case 1 – Existing traffic volumes (2004)
- Case 2 – Future traffic volumes (2012) without development;
- Case 3 – Future traffic volumes (2012) with the completion of the Winkler Property development.

Peak hours evaluated:

- 1) Weekday Morning Peak Hour
- 2) Weekday Evening Peak Hour

Committed developments considered:

None to be considered.

Intersection Descriptions

US Route 13 & Killens Pond Road / Reeves Crossing Road:

Type of Control: fully actuated signal. There is split phasing for the eastbound and westbound approaches and protected/permitted phasing for the northbound and southbound left-turn movements.

Eastbound approach: (Reeves Crossing Road) shared left/through/right-turn lane.

Westbound approach: (Killens Pond Road) shared left /through lane, and a channelized right-turn lane.

Northbound approach: (US Route 13) exclusive left-turn lane, two through lanes, and an exclusive right-turn lane.

Southbound approach: (US Route 13) exclusive left-turn lane, two through lanes, and an exclusive right-turn lane.

Killens Pond Road & Lake Forest High School/Elementary School (West Entrance):

Type of Control: two-way stop-controlled intersection.

Eastbound approach: (Killens Pond Road) exclusive left/through/right-turn lanes.

Westbound approach: (Killens Pond Road) exclusive left-turn lane and a shared through/right-turn lane.

Northbound approach: (Lake Forest High School) stop-controlled shared left/through/right-turn lane.

Southbound approach: (Lake Forest Elementary School) stop-controlled shared left/through/right-turn lane.

Killens Pond Road & Lake Forest High School/Elementary School (East Entrance):

Type of Control: two-way stop-controlled intersection.

Eastbound approach: (Killens Pond Road) exclusive left-turn lane and a shared through/right-turn lane.

Westbound approach: (Killens Pond Road) shared left/through/right-turn lane.

Northbound approach: (Lake Forest High School) stop-controlled shared left/through/right-turn lane.

Southbound approach: (Lake Forest Elementary School) stop-controlled shared left/through/right-turn lane.

Killens Pond Road & Chimney Hill Road:

Type of Control: two-way stop-controlled T-intersection

Eastbound approach: (Killens Pond Road) shared left/through lane.

Westbound approach: (Killens Pond Road) shared through/right-turn lane.

Southbound approach: (Chimney Hill Road) shared left/right-turn lane.

Killens Pond Road & Site Entrance (West):

Type of Control: two-way stop-controlled T-intersection.

Eastbound approach: (Killens Pond Road) shared left-turn/through lane.

Westbound approach: (Killens Pond Road) shared through/right-turn lane.

Southbound approach: (Site Entrance) stop-controlled shared left/right-turn lane.

Killens Pond Road & Site Entrance (East):

Type of Control: two-way stop-controlled T-intersection.

Eastbound approach: (Killens Pond Road) shared left-turn/through lane.

Westbound approach: (Killens Pond Road) shared through/right-turn lane.

Southbound approach: (Site Entrance) stop-controlled shared left/right-turn lane.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: According to Delaware Transit Corporation's (DTC) DART First State website, there currently are no transit services that travel along Killens Pond Road or provide service in the area.

Planned transit service: As the region grows and transit service is expanded, the Winkler Property could be a good candidate for a future transit stop.

Existing bicycle and pedestrian facilities: According to the "Delaware Bicycle Touring Map – Kent and Sussex Counties," Delaware Bicycle Route 1 runs along Killens Pond Road. Killens Pond Road is also rated with above average cycling conditions because of the very low existing traffic volumes (less than 2,000 vehicles per day) that travel along the roadway. Also, along the south side of Killens Pond Road is an asphalt pedestrian/bicyclist path that connects Killens Pond State Park, Lake Forest High School, and Lake Forest trailer park.

Planned bicycle and pedestrian facilities:

The following bicycle and pedestrian facilities should be included:

- The developer should investigate potential bicycle and pedestrian connections between the proposed development driveways and the existing bicycle path along the south side of Killens Pond Road in order to facilitate safe access to the bicycle path.
- A five-foot bicycle lane should be striped through each of the development's entrances (in addition to any required turn lanes) in order to facilitate safe and unimpeded bicycle travel.
- Utility covers should be moved outside of any potential bicycle lane or be flush with the pavement.
- Regulatory/warning signage should be added to any forthcoming plans to this project in order to alert motorists to the presence of bicycle traffic.
- Internal sidewalks should be installed within the development.
- A ten-foot minimum width multi-modal path with a minimum of a five-foot buffer from the roadway should be constructed along Killens Pond Road for the length the site frontage to facilitate future connection to the Lake Forest Elementary school property.

Previous Comments

All comments from DelDOT's Scoping Letter and Preliminary TIS Review were addressed in the Final TIS submission, except as follows:

- The requested evaluation to determine conformance with applicable DelDOT, AASHTO and MUTCD standards was not completed.
- The applicant did not contact Mr. Joseph Cantalupo, Assistant Director for Statewide & Regional Planning.
- The applicant did not contact Mr. David Dooley, a Service Development planner at the Delaware Transit Corporation.

HCS Analysis Comments

General

- 1) When calculating the percentage of heavy vehicles for both existing and future scenarios, DBF performed the calculation by movement. McCormick Taylor calculated the percentage by lane group.
- 2) The peak hour factors (PHF) utilized by DBF in the future cases (without development and with full development) only changed for the movements where volume increases were forecasted. McCormick Taylor changed the PHFs for all movements of an approach if any of the movements were forecasted with volume increases.

US Route 13 & Killens Pond Road/Reeves Crossing Road (See Table 2)

- 3) The McCormick Taylor analysis utilized the right-turn overlap capabilities of the intersection which resulted in improved LOS results when compared to the analysis completed by DBF for the TIS.

Killens Pond Road & Lake Forest High School/Elementary School (West) (See Table 3)

- 4) No comments.

Killens Pond Road & Lake Forest High School/Elementary School (East) (See Table 4)

- 5) No comments.

Killens Pond Road & Chimney Hill Road (See Table 5)

- 6) No comments.

Killens Pond Road & Site Entrance (West) (See Table 6)

- 7) No comments.

Killens Pond Road & Site Entrance (East) (See Table 7)

- 8) No comments.

Table 2
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for the Winkler Property
Report dated July 2005
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ¹	LOS per TIS		LOS per McCormick Taylor Review ²	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
US Route 13 & Killens Pond Road / Reeves Crossing Road				
2005 Existing	C (0.81)	B (0.67)	D (0.83)	B (0.66)
2012 Without Development	C (0.76)	C (0.71)	C (0.83)	C (0.71)
2012 with Full Development	C (0.66)	B (0.65)	C (0.77)	B (0.65)

¹ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

² The difference in the Xc values is due to differences in the phasing and cycle lengths used for the analysis (e.g. cycle lengths are divisible by 5) as well as calculation differences in the heavy vehicle percentages.

Table 6
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for the Winkler Property
Report dated July 2005
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection ⁸ Two-Way Stop Controlled	LOS per TIS		LOS per McCormick Taylor Review	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2012 With Development				
Eastbound Killens Pond Road – Left	A (7.6)	A (7.9)	A (7.6)	A (7.9)
Southbound Site Entrance	A (10.0)	B (10.2)	A (10.0)	B (10.2)

Table 7
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for the Winkler Property
Report dated July 2005
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection ⁸ Two-Way Stop Controlled	LOS per TIS		LOS per McCormick Taylor Review	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2012 With Development				
Eastbound Killens Pond Road – Left	A (7.5)	A (7.9)	A (7.5)	A (7.9)
Southbound Site Entrance	B (10.9)	B (11.1)	B (10.9)	B (11.1)

⁸ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

September 26, 2005

Mr. Michael J. Petit de Mange
Director of Planning
Department of Planning Services
Kent County Administrative Complex
555 Bay Road
Dover, DE 19901

Dear Mr. Petit de Mange:

The attached Traffic Impact Study (TIS) review letter for the **Winkler Property** subdivision has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Rules and Regulations for Subdivision Streets and other accepted practices and procedures for such studies. DelDOT accepts this TIS review and concurs with the recommendations. We are providing it to you for your information in your review of the plans for the subject development. If you have any questions concerning this letter or the attached review letter, please contact me at (302) 760-2134.

Sincerely,

Todd J. Sammons
Project Engineer

TJS:km

Enclosures

cc with enclosures: Ms. Constance C. Holland, Office of State Planning Coordination
Mr. Dennis Hughes, Davis, Bowen & Friedel
Mr. Mark Luszc, McCormick Taylor
Mr. Brad Herb, Johnson, Mirmiran & Thompson
DelDOT Distribution

DelDOT Distribution

Nathan Hayward III, Secretary of Transportation
Frederick H. Schranck, Deputy Attorney General
Darrel Cole, Chief of Community Relations, Public Relations
Carolann D. Wicks, Director, Transportation Solutions (DOTS)
Ralph A. Reeb, Director, Division of Planning
Robert F. Carver, Jr., Capital Budget Manager, Finance
Michael H. Simmons, Assistant Director, Project Development South, DOTS
Donald D. Weber, Assistant Director, Traffic, DOTS
Joseph Cantalupo, Assistant Director, Statewide & Regional Planning
Gregory P. Oliver, Assistant Director, Statistics, Research and Special Programs
Theodore G. Bishop, Assistant Director, Development Coordination
Thomas E. Meyer, Traffic Studies Manager, Traffic, DOTS
William J. Dryden, Transportation Planner, Project Development South, DOTS
Wayne M. Henderson, Service Development Planner, Delaware Transit Corporation
Subdivision Engineer, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION

800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

NATHAN HAYWARD III
SECRETARY

October 12, 2005

Mr. Michael J. Petit de Mange
Director of Planning
Department of Planning Services
Kent County Administrative Complex
555 Bay Road
Dover, DE 19901

Dear Mr. Petit de Mange:

On September 26, 2005, I sent your office a letter transmitting the Traffic Impact Study (TIS) review letter for the **Winkler Property** subdivision, prepared by McCormick Taylor. McCormick Taylor prepared the September 2, 2005 TIS review letter on DelDOT's behalf and made a specific recommendation regarding improvements to Killens Pond Road. McCormick Taylor's original recommendation regarding Killens Pond Road was to improve Killens Pond Road, from US Route 13 to Chimney Hill Road (Kent Road 385) to meet DelDOT's local road standards as nearly as possible within the available right-of-way. The improvements then contemplated would have included two-eleven-foot travel lanes and two five-foot shoulders.

On October 11, 2005 we met with the developer and their engineer, Davis, Bowen & Friedel, Inc. (DBF). Based on that meeting, a detailed discussion of the recommendation mentioned above, and clarification of existing roadway characteristics, specifically the fact that the travel lane width is currently twelve feet, we have decided to alter our initial recommendation to the bolded recommendation below:

The developer should improve Killens Pond Road, from US Route 13 to the Winkler Property's eastern edge to meet DelDOT's local road standards as nearly as possible within the available right-of-way. These improvements should include two twelve-foot travel lanes and two four-foot shoulders and occur during or prior to the first phase of development street construction.

Mr. Petit de Mange
October 12, 2005
Page 2 of 2

We are providing it to you for your information in your review of the plans for the subject development. If you have any questions concerning this letter, please contact me at (302) 760-2134.

Sincerely,



Todd J. Sammons
Project Engineer

TJS:km

Enclosures

cc with enclosures: Ms. Constance C. Holland, Office of State Planning Coordination
Mr. Dennis Hughes, Davis, Bowen & Friedel
Mr. Mark Luszcz, McCormick Taylor
Mr. Brad Herb, Johnson, Mirmiran & Thompson
DelDOT Distribution

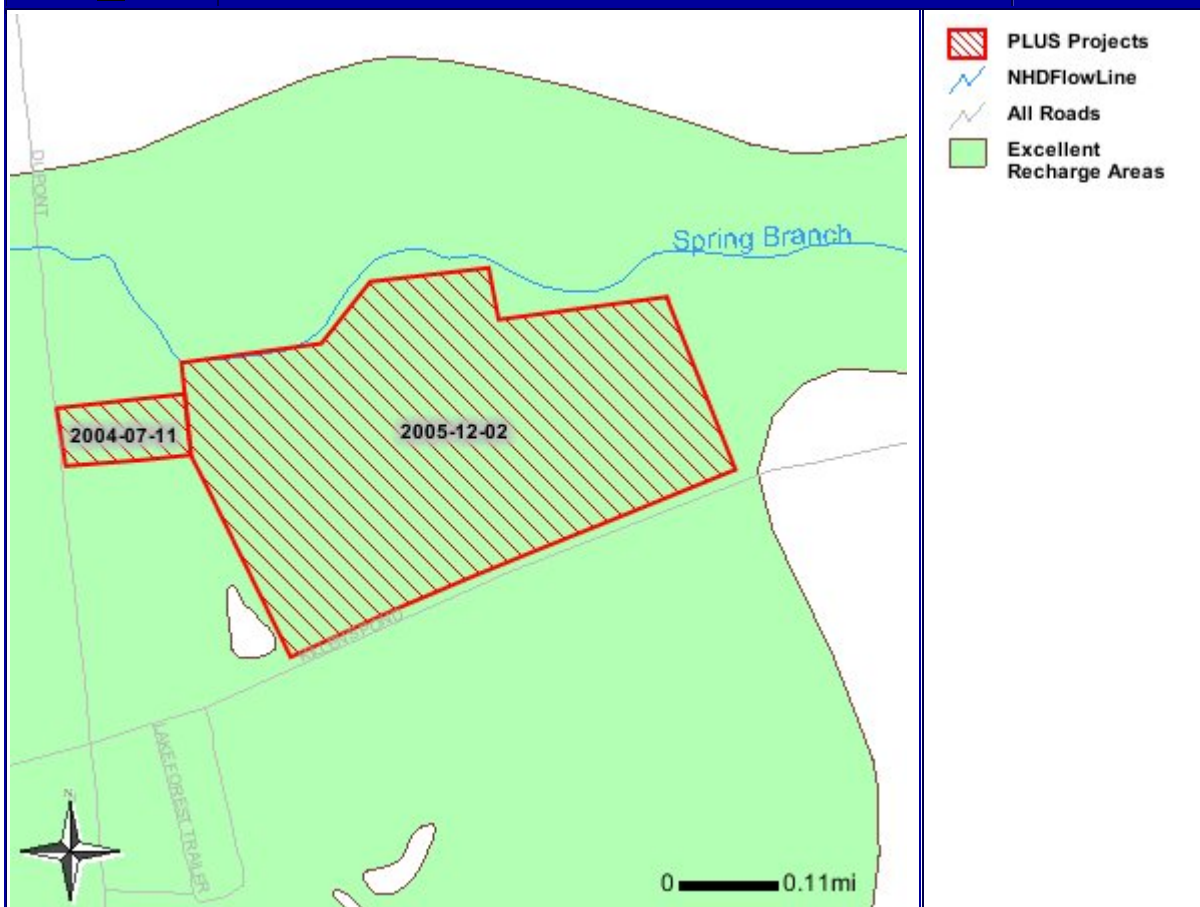
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Subdivision Engineer, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination



Spartan Village

2005-12-02



This map was produced by the Delaware Department of Natural Resources and Environmental Control.

